



YCAS/YDAS REMOTE DX COOLER APPLICATION INFORMATION

ENGINEERING SUPPLEMENT

Supersedes: 201.10-ES2 (897)

Form 201.10-ES2 (198)

GENERAL

This Engineering Supplement contains general recommendations and/or guidelines for outdoor air-cooled screw chillers with optional indoor DX coolers.

BACKGROUND

Outdoor air-cooled chiller popularity has grown considerably over the last 15-to-20 years. This has occurred for many reasons, ranging from lower installation costs to lower maintenance requirements and costs versus the water cooled chillers with outdoor cooling towers. In an effort to maximize the use of the available job-site space, consulting engineers are continually under pressure to locate outdoor equipment in areas where they will consume the least amount of space. However, there is still concern about the potential for DX coolers freezing up in areas where the outdoor temperature drops below 32°F (0°C). This is causing consulting engineers to issue chiller system designs with the unit's DX cooler mounted remotely inside the building where freezing will not occur. This supplement addresses some of the issues which should be considered for this type of application.

This supplement is intended for applications with leaving liquid temperatures between 40° to 50°F (4.4° to 10°C). The factory should be consulted for suitability for other special applications such as process or ice-storage duties.

COMPONENT LOCATIONS & REFRIGERANT PIPING

It is prudent practice to design these systems so that the remote DX cooler is as close to the outdoor section as possible. This assures optimum performance and reduces piping-pressure penalties. If a close-coupled system cannot be accommodated, the following maximum piping recommendations should be followed:

200 linear feet of piping;

300 equivalent feet of piping (which includes tees, elbows, fittings, etc.);

The DX cooler should be no lower than 100 feet below outdoor section;

REFRIGERANT PIPING SIZING

The system designer must select suction-and liquid-line sizes which will meet full-load capacities and provide for proper oil return at minimum system operation. The designer should follow the guidelines and practices presented in the latest edition of the ASHRAE Refrigeration Systems Handbook. When the DX cooler is located below the outdoor section, the suction line sizing must be checked for proper oil return. The ASHRAE Refrigeration Handbook contains tabular data which will aid the designer in this. If a single suction riser does not allow for proper oil return, double suction risers will be required to accomplish this. Suction lines must be insulated to help maintain optimum system performance. When suction lines are greater than 25 feet, an extra oil trap is recommended for each 25 feet of vertical rise from the DX cooler up to the outdoor section.

Provisions should be made for contraction and expansion of $\frac{3}{4}$ " per 100 feet of copper piping. See the typical piping illustrations on the following pages.

PERFORMANCE CONSIDERATIONS

Since the DX cooler is not mounted on the outdoor section, consideration should be given to adjusting the equipment's published performance due to the additional suction-and liquid-piping which has been added to the system. The following adjustments should be considered for each 100 equivalent feet of piping added to the system.

Capacity in Tons X 0.99
Compressor KW Input X 1.003

NOTE: Remote DX-cooler applications are not part of the scope of the industry ARI Certification Program.

TYPICAL SYSTEM LAYOUTS

Please refer to the illustrations for the typical system-layout arrangements. Figure 1 shows a typical outdoor section at the same level as the DX cooler located inside the building. Figure 2 is an example of the outdoor section installed above the indoor DX cooler. All horizontal suction-line segments should be sloped $\frac{1}{4}$ " per linear foot in the direction of refrigerant flow towards the compressors.

INSTALLATION RECOMMENDATIONS

Please refer to either the field installation drawing which is shipped with the equipment or the Installation, Operation, Maintenance Forms 201.10-NM1 or 201.10-NM1.1 for more details and guidelines. These include recommendations for field wiring, field-piping brazing with nitrogen, leak checking, refrigerant charging, checking the superheat and subcooling, and other pertinent information.

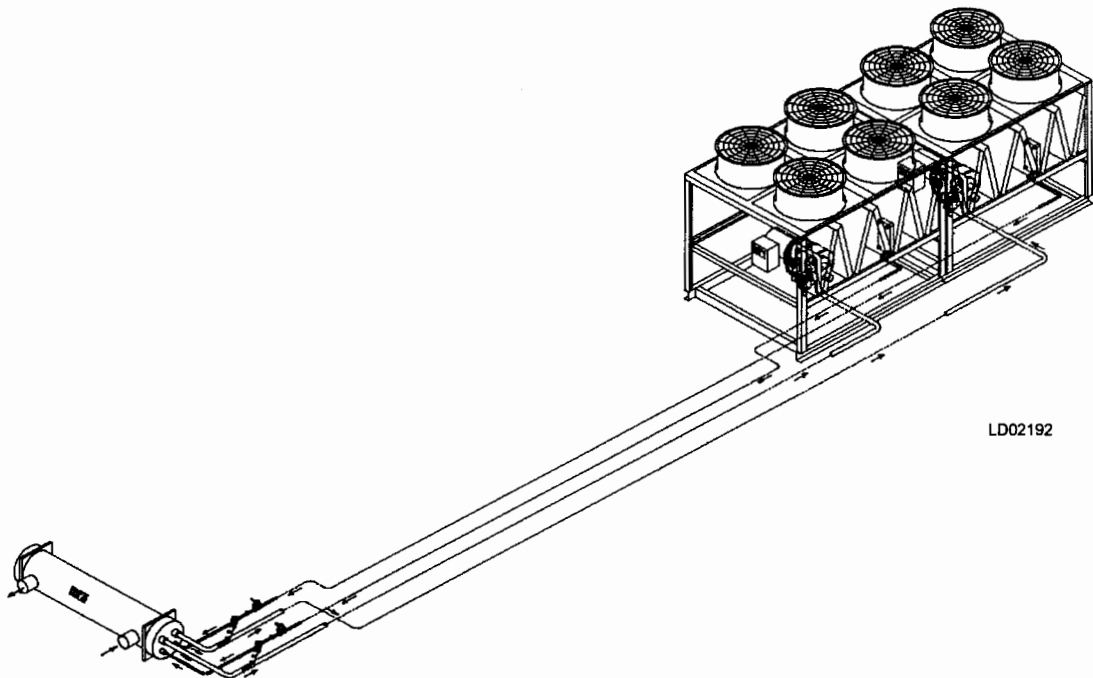
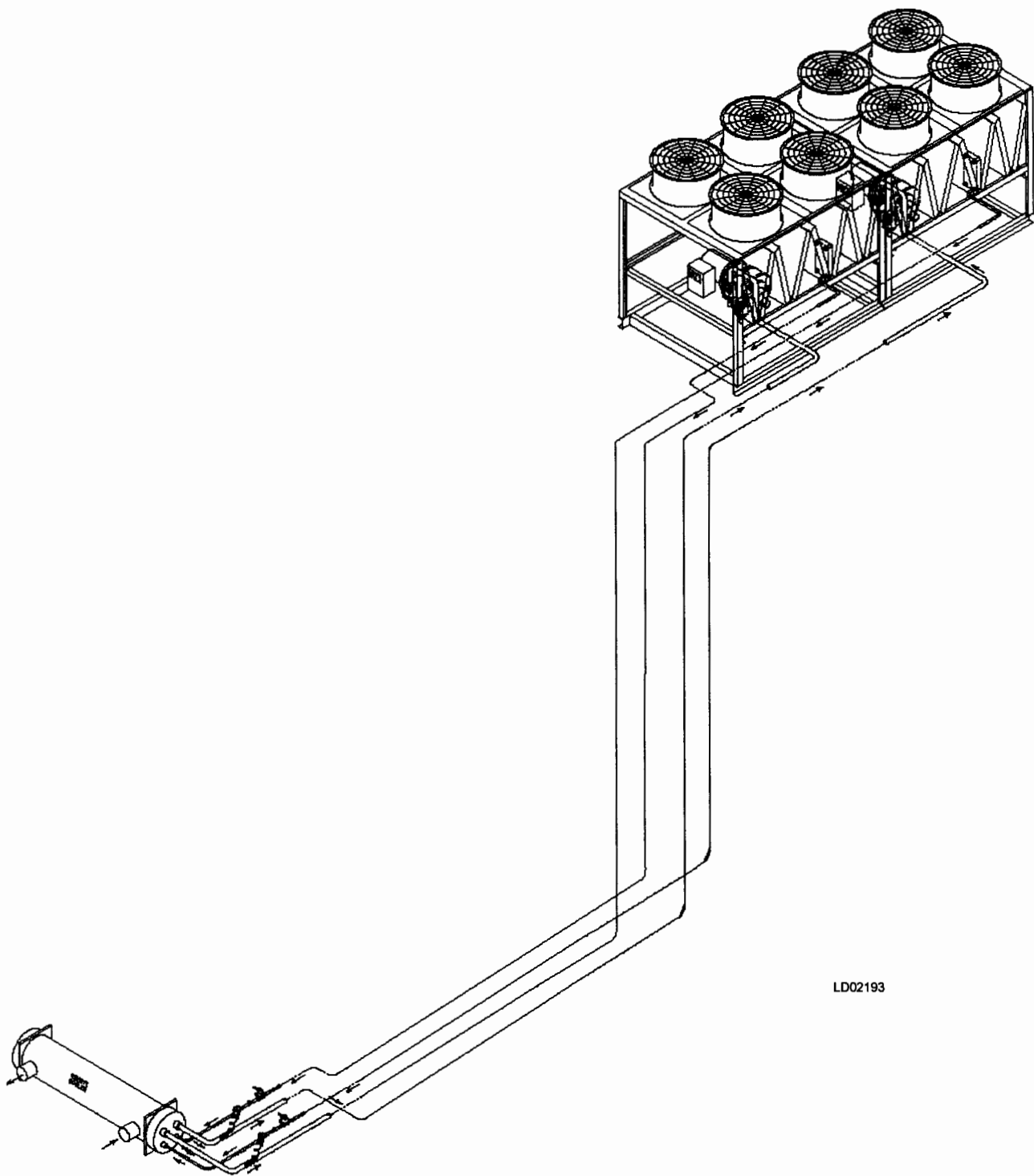


FIG. 1 DX COOLER AT THE SAME LEVEL AS THE OUTDOOR SECTION



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FIG. 2 DX COOLER BELOW THE OUTDOOR SECTION

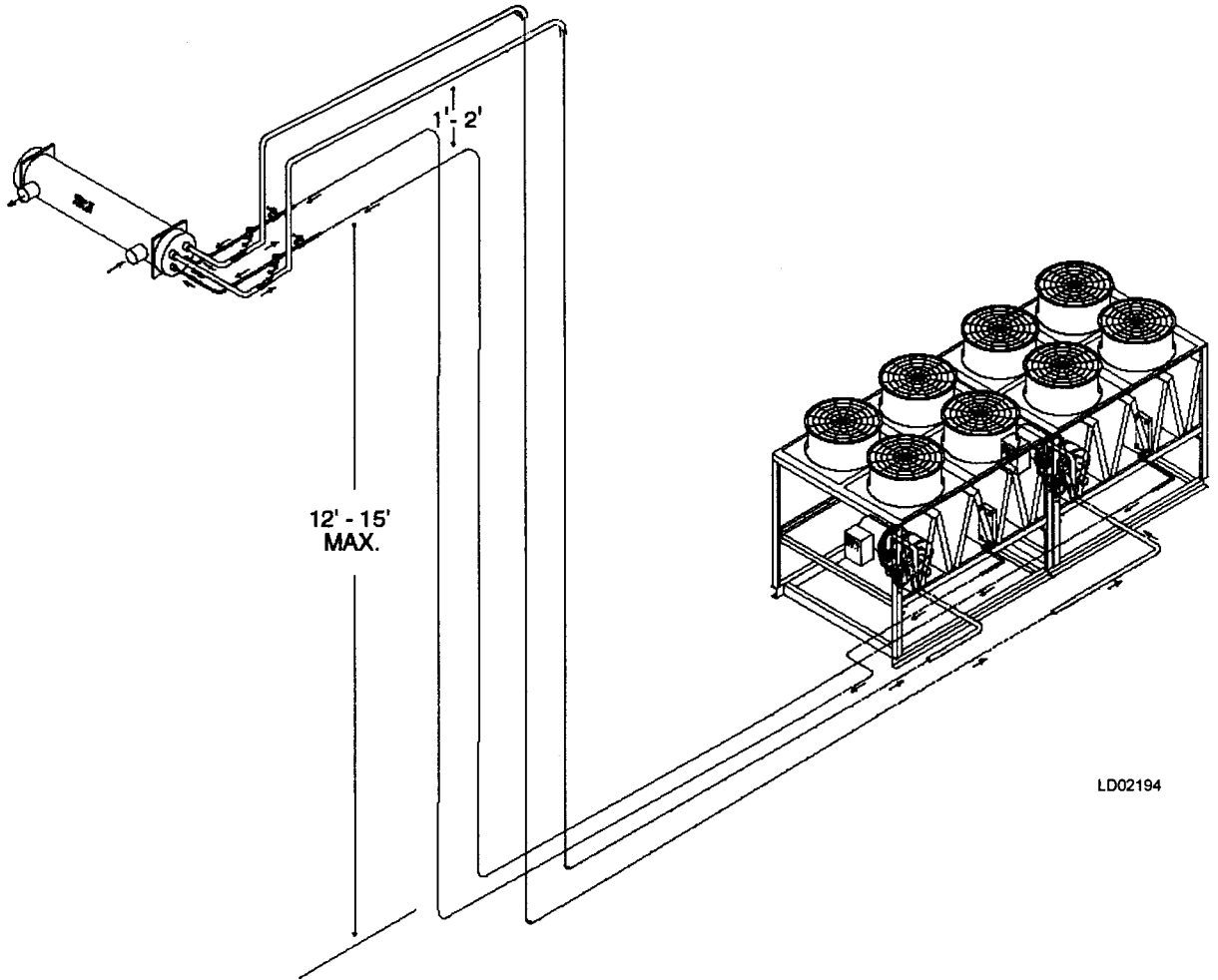


FIG. 3 DX COOLER BELOW THE OUTDOOR SECTION

